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United States Patent [19]

Loos

[11] **Patent Number:** 5,782,874[45] **Date of Patent:** Jul. 21, 1998[54] **METHOD AND APPARATUS FOR
MANIPULATING NERVOUS SYSTEMS**[76] **Inventor:** Hendricus G. Loos, 3019 Cresta Way,
Laguna Beach, Calif. 92651[21] **Appl. No.:** 788,582[22] **Filed:** Jan. 24, 1997**Related U.S. Application Data**[63] Continuation-in-part of Ser. No. 447,394, May 23, 1995,
abandoned, which is a continuation of Ser. No. 68,748, May
28, 1993, abandoned.[51] **Int. Cl.⁶** A61N 1/40[52] **U.S. Cl.** 607/2[58] **Field of Search** 607/1, 2, 39, 45,
607/46, 62, 75, 115, 152; 600/26; 602/2;
128/897, 908[56] **References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—William E. Kamm[57] **ABSTRACT**

Apparatus and method for manipulating the nervous system of a subject through afferent nerves, modulated by externally applied weak fluctuating electric fields, tuned to certain frequencies such as to excite a resonance in certain neural circuits. Depending on the frequency chosen, excitation of such resonances causes relaxation, sleepiness, sexual excitement, or the slowing of certain cortical processes. The weak electric field for causing the excitation is applied to skin areas away from the head of the subject, such as to avoid substantial polarization current densities in the brain. By exploiting the resonance phenomenon, these physiological effects can be brought about by very weak electric fields produced by compact battery-operated devices with very low current assumption. The fringe field of doublet electrodes that form a parallel-plate condenser can serve as the required external electric field to be administered to the subject's skin. Several such doublets can be combined such as to induce an electric field with short range, suitable for localized field administration. A passive doublet placed such as to face the doublet on either side causes a boost of the distant induced electric field, and allows the design of very compact devices. The method and apparatus can be used by the general public as an aid to relaxation, sleep, or arousal, and clinically for the control and perhaps the treatment of tremors and seizures, and disorders of the autonomic nervous system, such as panic attacks.

9 Claims, 5 Drawing Sheets